

SUPPORT FOR THE AMENDMENTS

Support for the amendment to Claim 1 is found in original Claim 12.

Claims 12 and 13 are herein canceled.

No new matter will be added to this application by entry of this amendment.

Upon entry of this amendment, Claims 1-11 and 14-21 are active.

REMARKS/ARGUMENTS

The claimed invention is directed to a recording ink of cyan, yellow or magenta color, an ink cartridge, an inkjet recording apparatus and an inkjet recording process. Recording inks of cyan, yellow and magenta color for an inkjet apparatus and inkjet process which provide good delivery stability, a high quality image and improved color saturation are sought.

The claimed invention addresses this problem by providing cyan, yellow and magenta recording inks comprising: water, a wetting agent, a surfactant, and a colorant wherein the wetting agent comprises 3-methyl-1,3-butanediol. No such cyan, yellow or magenta inks are disclosed or suggested in the cited references.

Applicants respectfully note that Claim 1 is herein amended to recite that the recording ink is at least one selected from the group consisting of a cyan ink, a magenta ink, and a yellow ink.

The rejection of Claims 1-3, 11, 14-17 and 19-21 under 35 U.S.C. 102(b) over Takashi (JP 11-323221) is respectfully traversed.

Takashi does not disclose or suggest a cyan, yellow or magenta ink.

Takashi describes an aqueous ink containing a black pigment which is a self-dispersion type carbon black. To prepare such a self-dispersion carbon black, pigment

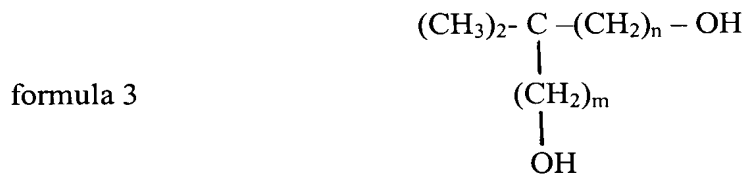
carbon black is surface treated with various agents which react with the pigment to chemically attach a hydrophilic group to the pigment surface. The presence of such hydrophilic groups eliminates the necessity for a conventional dispersing agent in the Takashi ink. Nowhere does this reference disclose, suggest or provide motivation to one of ordinary skill in the art which would lead to the cyan, yellow or magenta ink of the claimed invention.

Accordingly, Applicants respectfully submit that the cited reference can neither anticipate nor render obvious the claimed invention. Withdrawal of the rejection of Claims 1-3, 11, 14-17 and 19-21 under 35 U.S.C. 102(b) over Takashi (JP 11-323221) is respectfully requested.

The rejection of Claims 4-10, 12-13 and 18 under 35 U.S.C. 103(a) over Takashi in view of Namba et al. (U.S. 2005/0054751) and Nagashima et al. (U.S. 2005/0170989) is respectfully traversed.

The cited combination of references neither discloses nor suggests the significant improvement in color saturation obtained with the cyan, yellow and magenta inks according to the claimed invention.

As indicated above, Takashi describes an aqueous black ink composition containing a self-dispersing carbon black. This reference also describes a compound of the formula 3 as a component of the ink:



wherein n is 1 or 2, and m is 0, 1 or 2. 3-Methyl-1,3-butanediol is one of several compounds cited as a compound according to formula 3. Nowhere does this reference disclose or suggest that an ink formulation comprising colorant as an aqueous

dispersion of polymer fine particles and 3-methyl-1,3-butanediol would provide significant improvement in color saturation.

The Office admits that Takashi fails to disclose an aqueous dispersion of polymer fine particles as well as the items listed as (2) to (8) on pages 4-7 of the Official Action.

Namba is cited to show an aqueous dispersion of polymer fine particles and other items (2) to (8).

Namba describes an ink composition comprising a polymer emulsion of polymer fine particles containing coloring material, a first hydroxy compound, a second hydroxyl compound having 8 to 11 carbon atoms, a glycol ether having 8 to 11 carbon atoms, a water soluble organic solvent, at least one surfactant and at least one fluorine surfactant. Nowhere does this reference disclose 3-methyl-1,3-butanediol and nowhere is there a disclosure or suggestion that color saturation would be improved in an ink composition as according to the claimed invention.

Nagashima is cited to show the fluorinated surfactant according to Formula (I) in an ink composition.

Applicants respectfully call the Examiner's attention to the following excerpt from the Office's own discussion of "**Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.***"

"The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination would have yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention.⁴³ "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does."⁴⁴ **If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art,**" (Federal Register, Vol. 72, No. 195, page 57529) (Bold added)

Applicants respectfully submit that Takashi is directed to a self-dispersing carbon black ink composition which will not dry out and clog the jets during intermittent periods of use. Namba, on the other hand is directed to an ink-jet recording ink comprising a polymer emulsion of polymer fine particles containing a colorant. Nowhere does either reference disclose, suggest or provide motivation which would lead one of ordinary skill in the art to the claimed invention. Applicants respectfully submit that the technology and objectives of the cited references differ and therefore one of ordinary skill in the art would not be motivated to conclude that a combination of their elements would lead to nothing more than predictable results. Therefore, Applicants respectfully submit that according to the guidelines above, a conclusion that the claimed invention is obvious over the cited combination of references cannot be supported.

Moreover, Applicants have shown that significant improvement in color saturation is obtained with the inks of the claimed invention and such improvement is not disclosed or suggested by the cited combination of references. Data supporting the significant improvement is presented in Table 3 of the specification. Table 3 is shown below for the Examiner's convenience.

Table 3

	Yellow	Magenta	Cyan	Red	Green	Blue
Example 19	82.09	61.88	51.67	55.92	44.98	38.96
Example 20	81.24	61.68	51.04	55.74	44.75	38.75
Example 21	81.35	60.55	51.44	55.51	44.86	38.75
Example 22	81.37	60.68	51.62	55.49	44.91	38.83
Example 23	82.01	61.72	51.11	55.87	44.88	38.81
Example 24	82.06	61.69	51.58	55.91	44.87	38.89
Example 25	81.19	60.71	51.16	55.72	44.73	38.71
Example 26	81.99	61.73	51.59	55.91	44.92	38.86
Example 27	82.07	60.63	51.37	55.48	44.81	38.75
Example 28	82.06	61.89	51.18	55.87	44.79	38.8
Example 29	82.05	61.82	51.42	55.87	44.77	38.92
Comp. Ex. 10	78.73	60.01	49.75	54.11	42.22	35.87
Comp. Ex. 11	78.98	59.42	49.44	54.21	42.19	35.44
Comp. Ex. 12	78.61	59.67	49.69	54.19	42.23	35.59
Comp. Ex. 13	78.60	60.07	49.51	54.14	42.14	35.91

The experimental details are provided in the Examples in the specification and are only summarized in the following.

Inventive examples 19-29 are ink set combinations of cyan, yellow and magenta inks prepared according to the claimed invention. Comparative examples are ink sets prepared in a similar manner with the exception that 3-methyl-1,3-butanediol is replaced with 1,3-butanediol or 1,5-pentanediol. Both 1,3-butanediol and 1,5-pentanediol are cited by Namba as a first hydroxy compound wetting agent.


The prepared inks of each set were printed, dried and then evaluated for color saturation using CIE color coordinates. As indicated in Table 3, in every color space the ink sets according to the invention provide a print image of higher color saturation. The improvement ranges from approximately 2 to 10 per cent. Nowhere does the cited combination of references disclose or suggest such improvement due to the ink composition according to the claimed invention.

In consideration of the foregoing, Applicants respectfully submit that the cited combination of references can neither anticipate nor render obvious the claimed invention. Accordingly, withdrawal of the rejection of Claims 4-10, 12-13 and 18 under 35 U.S.C. 103(a) over Takashi in view of Namba et al. and Nagashima et al. is respectfully requested.

Applicants respectfully submit that the above-identified application is now in condition for allowance and early notice of such action is earnestly solicited.

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